ICS ADVENT

Power Options Manual

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Mission Critical Applied Computing Solutions

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Revision History

Date	Revision	Description of Change
03/00	5A	Added 300W ATX power supply to manual (PN 4-710108-0).
12/99	4A	Added 250W, redundant ATX power supply to manual (PN 4-710110-0).

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FOREWORD

This product manual provides information to install, operate and/or program the referenced product(s) manufactured or distributed by ICS Advent. The following pages contain information regarding the warranty and repair policies.

Check our Web site (***http://www.icsadvent.com/techsupport***) for technical information, manual, and BIOS updates. Technical assistance is also available at: **800-480-0044** (U.S. and Canada) or **858-677-0877** (international).

Manual errors, omissions, bugs, and/or comments: A Customer Comments section is included at the end of this manual. If you experience any problems with the manual or just want to give us some feedback, please review the information in this section. It will tell you how to easily access our web site and provide immediate feedback online.

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Guarantee

A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory.*

Refunds

In order to receive refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

Restocking Charges

Product returned *after* 30 days, and *before* 90 days, of the purchase will be subject to a **minimum** 20% restocking charge and any charges for damaged or missing parts.

Products not returned within 90 days of purchase, or products which are not in as-new and re-saleable condition, are not eligible for credit return and will be returned to the customer.

Limited Warranty

Effective April 1, 1998, all products carry a two-year limited warranty with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within two years of purchase, ICS Advent will repair or replace, at our option, any defective product. At any time after two years, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. ICS Advent will service the warranty for all standard catalog products for the first two years from the date of shipment. After the second year, for products not manufactured by ICS Advent, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

The **Return Procedure** must be followed to assure repair or replacement. ICS Advent will normally return your replacement or repaired item via Second Day Air. *Overnight delivery or delivery via other carriers is available at additional charge.*

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than ICS Advent or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of ICS Advent or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. ICS Advent reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by ICS Advent.

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Return Procedure

For any Limited Warranty or Guarantee return, please contact ICS Advent's Customer Service at **800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to ICS Advent for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

To reduce risk of damage, returns of product must be in an ICS Advent shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from ICS Advent Customer Service at a nominal cost.

Limitation of Liability

In no event shall ICS Advent be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. ICS Advent liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by ICS Advent or its authorized agent.

Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However in these instances , any deviations will be disclosed prior to sales and noted in the original invoice. ***ICS Advent reserves the right to refuse returns or credits on software or special order items.***

Advisories

Three types of advisories are used to stress important points or to warn of potential hazards to the user or the equipment. These advisories are the Note, the Caution, and the Warning. Examples follow.

Note: A Note presents special instructions or provides extra information to simplify the use of the product.

CAUTION!

A Caution alerts you to a situation which, if ignored, may cause injury or may damage equipment.

WARNING!

A Warning is used to alert you of a situation which, if ignored, will cause serious injury.

Cautions and warnings are accented by triangular symbols. The exclamation point in all cautions and warnings alerts you to the important instructions. The lightning flash symbol on the left side of caution or warning notifies you that the advisory relates to the presence of high voltage.

Use caution when servicing any electrical component. We have tried to identify the areas that may pose a caution or warning condition in this manual; however, ICS Advent does not claim to have covered all situations that might require the use of a caution or warning.

Refer to the documentation for any component you install into a computer system to ensure proper precautions and procedures are followed.

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Current Revision 5A

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Chapter 1: Introduction

This manual describes power options used in the following ICS Advent chassis groups; 6500, 7000, 7300, 7400, 7500, 7600, 7700, 8300, 8500, 8600, and 9300. (This manual covers all model numbers in each chassis group range from 00-99; for example, the 8500 chassis group includes the 8535, 8538, and 8540.) Specifications are listed in convenient tables that allow you to view them at a glance.

General Information

The power options in this manual are designed for use only with ICS Advent chassis. Refer to your chassis manual for information on product dimensions, connectors, operating and storage environment, and agency approvals.

This manual lists the maximum wattage available from the power supply to your system. Actual power available at the backplane for your feature cards depends on your system configuration. Make sure your connected components do not exceed the backplane's capacity. Refer to the *ISA Backplanes Manual* (part number 00431-101), the *ISA/PCI Backplanes Manual* (part number 00431-020), or the *Slot 1 Backplanes Manual* (part number 00431-242) for more information about backplane power requirements and limitations.

Note: This manual lists maximum specifications. Devices installed in your chassis may affect these values. Operating altitude, temperature, and power supply loading are interactive and may also cause your power supply to vary from the stated specifications.

How to Use this Manual

You can find your power option in two ways. First, power options in this manual are divided by type: four output, five output, ATX, and 48VDC. Select the type of power option and turn to the appropriate chapter. Then find the wattage for your option and review the specifications.

The second way to find details about your power option is to verify its part number by inspecting your chassis, packing list, or sales order. Then refer to Table 1-1 on the next page to see where your power option is described. The part number for your power supply should also be listed in your chassis manual.

Questions

If you have questions that are not covered in this manual, or if you want to upgrade to a different power option, please call ICS Advent at 1-800-523-2320.

Table 1-1: Power Options by Part Number

Power Option Part Number	Chapter
4-700041	2
4-700051	2
4-700053	5
4-700054	5
4-700062	2
4-700073	5
4-700087	2
4-700101	2
4-710063	2
4-710065	2
4-710072	2
4-710076	4
4-710077	4
4-710078	3
4-710084	4
4-710085	4
4-710092	2
4-710093	5
4-710094	4
4-710095	3
4-710108-0	4
4-710110-0	4

Chapter 2: Four-Output Options

Tables 2-1, 2-2, and 2-3 list specifications for four-output power options used in ICS Advent chassis.

Table 2-1: Four-Output Power Options, 250W–500W

	250 Watt (4-710065)	300 Watt (4-710063)	400 Watt (4-710072)	500 Watt (4-700051)
General	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable
Input current	6.2A @ 115VAC 3.1A @ 230VAC	6.2A @ 115VAC 3.1A @ 230VAC	8A @ 115VAC 4A @ 230VAC	12A @ 115VAC 12A @ 230VAC
Maximum output	Total load of –5 and –12V cannot exceed 18W.	Total load of –5 and –12V cannot exceed 40W.		Total load of –5 and –12V cannot exceed 96W.
	+5V @ 25–35A +12V @ 9A (13A peak) –5V @ 1.5A –12V @ 1.5A	+5V @ 24A +12V @ 13A –5V @ 3A –12V @ 3A	+5V @ 50A +12V @ 10A –5V @ 3A –12V @ 3A	+5 @ 80A +12 @ 10A (16A peak) –5 @ 2A –12 @ 10A
Overload protection	Power options are short circuit protected with automatic recovery. Current limit is based on the total output power.			
	140% of maximum load			All outputs are protected against overload and short circuit. Automatic recovery on removal of fault.
Minimum load	+5V @ 7A +12V @2.5A	+5V @ 7A +12V @ 2.5A	+5VDC @ 7A +12VDC @ 2.5A	+5VDC @ 8A +12VDC @ 0A
Load regulation	+5V @ ±5% +12V @ ±6% –5V @ ±11% –12V @ ±10%	+5V @ ±5% +12V @ ±6% –5V @ ±11% –12V @ ±10%	+5V @ ±5% +12V @ ±5% –5V @ ±10% –12V @ ±10%	+5V @ ±1% +12V @ ±1% –5V @ ±1% –12V @ ±1%

Table 2-1: Four-Output Power Options, 250W–500W (continued)

	250 Watt (4-710065)	300 Watt (4-710063)	400 Watt (4-710072)	500 Watt (4-700051)
Inrush current	40A @ 115VAC 80A @ 230VAC	40A @ 115VAC 80A @ 230VAC	50A @ 115VAC 100A @ 230VAC	30A @ 115VAC 50A @ 230VAC
Cooling Fan	35.3CFM			30CFM
Efficiency	65%			80%
MTBF	122,398hrs @ 25°C		120,142hrs @ 30°C	100,000hrs @ 30°C

Table 2-2: Four-Output Power Option, 150W

	150 Watt (4-700041)
General	115/230VAC, 50/60Hz, switch selectable
Input current	4A @ 115VAC 2A @ 230VAC
Maximum output	+5V @ 16A +12V @ 5.5A –5V @ 0.5A –12V @ 0.5A
Overload protection	Short circuit protected on all outputs.
	Case overload protected at 110% to 150% of rated output power.
Minimum load	+5V @ 2.5A +12V @ 0.5A
Load regulation	+5V @ ±5% +12V @ ±8% –5V @ ±10% –12V @ ±10%
Inrush current	<50A @ 115 or 230VAC
Cooling fan	28.2CFM
Efficiency	70%
MTBF	132,000 hrs @ 25°C

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Chapter 3: Five-Output Options

Table 3-1 lists specifications for five-output power options used in ICS Advent chassis.

Table 3-1: Five-Output Power Options, 300W– 400W

	300 Watt (4-710095)	400 Watt (4-710078)
General	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable
Input current	7A @ 115VAC 3.5A @ 230VAC	10A @ 115VAC 5A @ 230VAC
Maximum output	Total current of +5 and +3.3V cannot exceed 40A; –5V and –12V cannot exceed 15W.	Total current of +5 and +3.3V cannot exceed 58A; –5 and –12V cannot exceed 15W.
	+3.3V @ 7–28A +5V @ 16–30A +12V @ 10A –5V @ 1A –12V @ 1A	+3.3V @ 20–28A +5V @ 24–30A +12V @ 14A –5V @ 1A –12V @ 1A
Overload protection	Over power protection is at 110% to 150% of rated output power. The power supply latches all DC output into a shutdown state. Over power of this type shall cause no damage to power supply, after over power is removed and a power on/off cycle initiated, the power supply will restart.	
Minimum load	+3.3V @ 1A +5V @ 3A +12V @ 0.5A	+3.3V @ 1A +5VDC @ 3A +12VDC @ 0.5A

Table 3-1: Five-Output Power Options, 300W– 400W (continued)

	300 Watt (4-710095)	400 Watt (4-710078)
Load regulation	+3.3V @ ±5% +5V @ ±5% +12V @ ±5% –5V @ ±16% –12V @ ±10%	+3.3V @ ±5% +5V @ ±5% +12V @ ±6% –5V @ ±16% –12V @ ±10%
Inrush current	40A @ 115VAC 80A @ 230VAC	50A @ 115VAC 100A @ 230VAC
Cooling Fan	35.3CFM	
Efficiency	65%	
MTBF	118,439hrs @ 25°C	114,637hrs @ 25°C

Chapter 4: ATX Options

Tables 4-1 and 4-3 list specifications for ATX power options used in ICS Advent chassis.

Table 4-1: ATX Power Options, 250W – 400W

	250 Watt (4-710076)	300 Watt (4-710077)	300 Watt (4-710108-0)	400 Watt (4-710094)
General	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable
Input current	6A @ 115VAC 3A @ 230VAC	7A @ 115VAC 3.5A @ 230VAC	7A @ 115VAC 4A @ 230VAC	10A @ 115VAC 5A @ 230VAC
Maximum output	Total current of +3.3 and +5V can not exceed 30A. Total load of –5 and –12 can not exceed 15W.			Total current of +3.3 and +5V can not exceed 50A.
	+3.3V @ 20A +5V @ 16–30A +12V @ 8A –5V @ 0.5A –12V @ 0.5A +5VSB @ 0.8A	+3.3V @ 7–28A +5V @ 16–30A +12V @ 10A –5V @ 1A –12V @ 1A +5VSB @ 0.85A	+3.3V @ 14A +5V @ 30A +12V @ 8A –5V @ 0.5A –12V @ 0.5A +5VSB @ 1.5A	+3.3V @ 20 –28A +5V @ 24–30A +12V @ 14A –5V @ 1A –12V @ 1A +5VSB @ 0.85A
Overload protection	Over power protection is at 110% to 150% of rated output power. The power supply latches all DC output into a shutdown state. Over power of this type shall cause no damage to power supply, after over power is removed and a power on/off cycle initiated, the power supply will restart.			
Minimum load	+3.3V @ 1A +5V @ 2A	+3.3V @ 1A +5V @ 3A	+3.3V @ 0.5A +5V @ 7A	+3.3V @ 1A +5V @ 3A

Table 4-1: ATX Power Options, 250W– 400W (continued)

	250 Watt (4-710076)	300 Watt (4-710077)	300 Watt (4-7100108-0)	400 Watt (4-710094)
Load regulation	+3.3V @ ±5% +5V @ ±5% +12V @ ±6% –5V @ ±2% –12V @ ±11% +5VSB @ ±5%	+3.3V @ ±5% +5V @ ±5% +12V @ ±5% –5V @ ±16% –12V @ ±10% +5VSB @ ±5%	+3.3V @ ±4% +5V @ ±5% +12V @ ±5% –5V @ ±5% –12V @ ±10% +5VSB @ ±5%	+3.3V @ ±5% +5V @ ±5% +12V @ ±6% –5V @ ±5% –12V @ ±5% +5VSB @ ±5%
Inrush current	30A @ 115VAC 60A @ 230VAC	40A @ 115VAC 80A @ 230VAC	60A @ 115VAC 100A @ 230VAC	50A @ 115VAC 100A @ 230VAC
Cooling Fan	24.7CFM	35.3CFM		35.3CFM
Efficiency	65%	60%	65%	60%
MTBF	106,650hrs @ 25°C	106,449hrs @ 25°C	50,000hrs @ 25°C	103,905hrs @ 25°C

Table 4-2: ATX Power Options, 250W–300W, with AC Switch

	250 Watt (4-710084)	300 Watt (4-710085)
General	115/230VAC, 50/60Hz, switch selectable	115/230VAC, 50/60Hz, switch selectable
Input current	6A @ 115VAC 3A @ 230VAC	7A @ 115VAC 3.5A @ 230VAC
Maximum output	Total current of +3.3 and +5V cannot exceed 30A. Total load of –12 and –5V cannot exceed 15W.	Total current of +3.3 and +5V cannot exceed 40A. Total load of –12 and –5V cannot exceed 15W.
	+3.3V @ 20A +5V @ 16–30A +12V @ 8A –5V @ 0.5A –12V @ 0.5A +5VSB @ 0.8A	+3.3V @ 7–28A +5V @ 16–30A +12V @ 10A –5V @ 1A –12V @ 1A +5VSB @ 0.85A
Overload protection	Over power protection is at 110% to 150% of rated output power. The power supply latches all DC output into a shutdown state. Over power of this type shall cause no damage to power supply, after over power is removed and a power on/off cycle initiated, the power supply will restart.	
Minimum load	+3V @ 1A +5V @ 2A	+3V @ 1A +5V @ 3A
Load regulation	+3.3V @ ±5% +5V @ ±5% +12V @ ±6% –5V @ ±2% –12V @ ±11% +5VSB @ ±5%	+3.3V @ ±5% +5V @ ±5% +12V @ ±5% –5V @ ±16% –12V @ ±10% +5VSB @ ±5%
Inrush current	30A @ 115VAC 60A @ 230VAC	40A @ 115VAC 80A @ 230VAC
Cooling fan	24.7CFM	35.3CFM
Efficiency	65%	60%
MTBF	106,650hrs @ 25°C	106,449hrs @ 25°C

Table 4-3: ATX Power Option, 250W Redundant

	250 Watt Redundant Hot Swap (4-710110-0)
General	115/230VAC, 50/60Hz, auto ranging AC input from 90-264VAC, N+1 automatic redundancy, alarm will beep on failure
Input current	6A @ 115VAC 3A @ 230VAC
Maximum output	+5V @ 30A +3.3V @ 15A +12V @ 14A –5V @ 0.5A –12V @ 1A
Overcurrent protection	At 110% to ~130% of maximum wattage, power supply shuts down. Automatic recovery upon removal of fault.
Minimum load	+5V @ 3A +12V @ 1A
Load regulation	+5V @ ±5% +3.3V @ +5/-3% +12V @ ±5% –5V @ ±10% –12V @ ±10%
Efficiency	65%
MTBF	100,000hrs @ 25 °C

Chapter 5: 48VDC Options

Tables 5-1 and 5-2 list specifications for 48VDC power options used in ICS Advent chassis.

Table 5-1: 48VDC Power Options, 250W–350W

	250 Watt Heavy Duty (4-710093)	300 Watt (4-700053)	350 Watt (4-700054)
Input voltage	–48VDC		
Maximum output	+5V @ 30A +12V @ 12A –5V @ 1A –12V @ 1A	+5V @ 35A +12V @ 8A (10A peak) –5V @ 0.5A –12V @ 2.0A	+5V @ 50A +12V @ 9A (Minimum 3A, 15A peak) –5V @ 1A –12V @ 1A
Overload protection	Short circuit protected with automatic recovery.	Current limit based on total output power. Set at 140% of maximum load.	Short circuit protected with automatic recovery.
Minimum load	+5V @ 7A +12V @ 2.5A –5V @ 0A –12V @ 0A	+5V @ 3A +12V @ 1A peak –5V @ 0.1A –12V @ 0.5A	Minimum 10% required on +5V
Load regulation	+5V @ ±4% +12V @ ±6% –5V @ ±3% –12V @ ±3%	+5V @ ±1% +12V @ 3% –5V @ 3% –12V @ 3%	+5V @ ±5% (Minimum 10% load required) +12V @ ±5% –5V @ ±5% –12V @ ±5%
Inrush current	<10A @ 48VDC	25A @ 48VDC	Limited by soft-start circuitry.
Cooling fan	35.3CFM	35CFM	37CFM
Efficiency	65%	70%	75%
MTBF	156,644 hrs @ 25°C	110,000 hrs @ 30°C	200,000 hrs @ 30°C

Table 5-2: 48VDC Power Options, 300W Redundant

	300 Watt (4-700073)
Input voltage	–48VDC
Maximum output	+5V @ 30A +12V @ 8A (10A peak) –5V @ 0.5A –12V @ 2.0A
Overload protection	Short circuit protected with automatic recovery. Curent limit based on total output power and set at 140% of maximum load.
Minimum load	+5V @ 3A +12V @ 1A –5V @ 0.1A –12V @ 0.5A
Load regulation	+5V @ ±3% +12V @ ±5% –5V @ ±5% –12V @ ±5%
Inrush current	20A @ 48VDC
Cooling fan	35CFM
Efficiency	65%
MTBF	200,000hrs @ 30°C

Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

ICS ADVENT
6260 Sequence Drive
San Diego, CA 92121-4371
800 523-2320 / 858-677-0877

declares that the product:

4-700041, 4-700051, 4-700053, 4-700054, 4-700062, 4-700073, 4-700087, 4-700101, 4-710063, 4-710065, 4-710072, 4-710076, 4-710077, 4-710078, 4-710084, 4-710085, 4-710092, 4-710093, 4-710094, 4-710095, and 4-710110-0

to which this declaration relates, meets the essential health and safety requirements and is in conformity with the relevant EU Directives listed below:

EU EMC Directive 89/336/EEC
EU Low Voltage Directive 73/23/EEC

using the relevant section of the following EU standards and other normative documents:

EN 50081-1:1992 Emissions, Generic Requirements.
-EN 55022 Measurement of radio interference characteristics of information technology equipment.

EN 50082-1:1992 Immunity, Generic Requirements.
-IEC 1000-4-2:1995 Immunity for radiated electromagnetic fields.
(Supersedes IEC 801-2)
-IEC 1000-4-3:1995 Immunity for radiated RF electromagnetic fields.
(Supersedes IEC 801-3)
-IEC 1000-4-4:1995 Immunity for AC and I/O lines, fast transients common mode.
(Supersedes IEC 801-4)

EN 60950:1992 Safety of Information Technology Equipment.

Mr. Jim Jameson
President & Chief Executive Officer

January 8, 1999
San Diego, CA

Information supporting this declaration is contained in the applicable Technical Construction file available from:

ICS ADVENT

ICS Advent Europe
Ben Turner Industrial Road
Oving Road
Chichester, West Sussex
PO19 4ET, UK

Customer Comments

If you experience any problems with this manual or just want to give us some feedback, please review the form below. Please detail any errors you find and send the information to us via our Web site. We will correct the errors/problems as soon possible and put the latest version up on our Web site. Once the manual is updated, you may download a .pdf copy from our technical support library at:
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E-mail address: _____

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Product: **Power Options Manual**

Manual Revision: **00431-240-5A**

On the web site there will also be a place where you can enter your error information, comments, concerns about our products, and/or request technical support.

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